NCPA Download

The Official Journal of the Northern California Packet Association
Serving Amateur Radio Digital Communication in Northern California

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In This Issue

The President's Letter

Lew Jenkins, N6VV

For those of you who missed it, the April meeting of the Northern California Packet Association was an incredible event. Over fifty individuals from all of the different components of the Northern California digital world were present. At the meeting were representatives from the BBS SysOps, DX PacketCluster, TCP/IP, and the Keyboard community.

Due to the limited spectrum space available to us a number of conflicts had developed over channel usage. DX PacketCluster and TCP/IP were in a heated battle. BBS and keyboard users were involved in disagreements regarding frequencies. Everyone expected this meeting to be something of a bloodbath because getting these warring factions in the same room for the first time was considered dangerous. Many key players in the packet community were heard to say they were coming to fight.

The meeting turned out to be anything but a bloodbath. Some participants described it as a "lovefest". Nobody was more surprised than me. I had actually scheduled the meeting at the Pleasant Hill Police Department in case we would need to call in the authorities to break up some fights. We had expected only about 20 to 25 participants so when the room began to fill up with double that number I started to get worried.

...a spirit of enlightened cooperation

I've thought a lot about why there was such a spirit of enlightened cooperation at this meeting between groups who just the week before had been jamming each other on the airwaves. I think the answer is that there was an intuitive understanding that digital forms of communication represent the fastest growing segment of Amateur Radio activity. By some estimates, Packet has experienced a 300 percent growth in activity in the past 12 months alone. It is currently estimated that there are now over 45,000 packet users in the United States with estimates of as many as 10,000 in Northern California.

It is small wonder therefore that all of this activity, jammed into 10 channels on 2 meters would not give rise to channel conflicts. There simply was not enough spectrum space dedicated to digital forms of communication. Worse yet, the specter of losing the 220 backbone frequencies which carries some of the highest traffic volumes on any amateur VHF frequency in the world, put additional pressure on the UHF spectrum where packet had but a single channel for packet usage.

In short, we discovered something incredible about each other at the April meeting; *"We're not the enemy!"* We were like rats in a cage fighting for a very tiny bit of space. A space which represent only a fraction of a percent of the available spectrum space.

Those of us involved in the "Good ol' Boy" world of repeater channel allocations know that the real enemy was the growth of a new technology and the pressures this brought to bear upon existing spectrum users.

Many of us know that the UHF spectrum, for example, is characterized by the "One Man — One Repeater" rule.

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***The President's Letter** from page 1*

Hundreds of channels are occupied by "private" repeaters where only an occasional chat with a friend or spouse can be heard. The argument "I was here first" rings hollow when one considers the historical perspective. I always ask "Well who was there before you ?" The answer is usually "Well just the AM and SSB guys, but with the advent of mountaintop FM repeaters the new technology came in and displaced the older technologies." All I can do is smile, nod my head, and say "Exactly".

Our colleagues at NARCC have welcomed NCPA as the packet frequency coordinators.

The charter of NCPA does not call for the seizure of repeater channels by packet users. Far from it. Our mission is to work with NARCC in coordinating packet activities. Our colleagues at NARCC have been most cooperative with us in our mission and have openly welcomed the advent of NCPA as the packet frequency coordinators. It is a job which only the most foolhardy would consider taking on. The unique networking capabilities of packet provide wonderful opportunities as well as unique challenges. The NCPA frequency coordinator, Brad, WA6AEO, has his work cut out for him, but with your cooperation we can create a network which works in harmony and provides the optimum in connectivity for all users, whatever your interests are.

The most concrete example of our cooperation with NARCC is the allocation of the 433.0-433.5 MHz band for the digital service. This promises to be the most significant advancement in several years. Plans are underway for the construction of new high-speed backbones on 433 which will dramatically improve network connectivity and throughput.

Channel conflicts between BBSs, DX PacketCluster, TCP/IP and Keyboard users, have been resolved in the new NCPA band plan. All of these services should see dramatic improvements in network performance, due to the minimization of interference between these services.

Channel conflicts ... have been resolved in the new NCPA band plan.

As can be seen by these statements, one of the primary missions of NCPA is coordination. Another very important mission is education. This newsletter is the first attempt to spread the word about the NCPA. By educating users about the variety of digital services available in Northern California we can also serve the local amateur community. A knowledgeable user is a better user. To that end, NCPA has also formed an Education Committee which is responsible for creating training seminars and documentation on how to get the most out of the digital services available. NCPA is also sponsoring the packet forum at this years PacificCon.

You may be wondering who is doing all this. The answer is simple. You are. We need help. Like any volunteer organization, NCPA is only as good as the people who get involved. If you think the activities mentioned above are of value, I urge you to get involved. We need help in every area. We need people to get involved in education, training, running packet seminars at local clubs, staffing the convention booths, writing articles and publishing the newsletter, frequency coordination, building the network, putting up mountaintop nodes, construction and maintenance of new high speed modems, network management. We want to build new High-Speed links to Los Angeles and to the Pacific Northwest. If you have a good location for a node, you can help. At a minimum take advantage of the coupon on the back cover to join the NCPA. Your money will support all of the activities.

Networking is by definition a cooperative venture. Through the NCPA we hope to create a forum whereby individuals can cooperate to create a network, rich in its diversity, but strong in capability. You can be a part of that. Join the NCPA today...

73's Lew Jenkins, N6VV

President, Northern California Packet Association

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NCPA *Download* is published by the Northern California Packet Association for the entertainment and education of Amateur Radio operators using digital modes, and those with an interest in it.

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ARRL No-Code Plan Needs Work

When the new Hams encouraged by the inevitable no-code license appear, they will operate on VHF and UHF, and they will use digital modes. While NCPA has not taken a position on the wisdom of a no-code license, we must surely welcome these newcomers and help them to become members of the fraternity.

NCPA believes that the plan proposed by the ARRL Codefree License Committee creates conflicts between these newcomers and today's users. Here is the letter NCPA sent to the ARRL pointing out the difficulties.

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May 3, 1989

George S. Wilson, III, W4OYI
Chairman, Codefree License Committee, ARRL
1649 Griffith Avenue
Owensboro, KY 42301

Dear Chairman Wilson,

The Northern California Packet Association (NCPA) represents all facets of amateur radio digital communications in the Northern California Area. Our members and member organizations include nearly 10,000 amateurs.

The NCPA objects to the defacto band-planning your proposal would enact in the 144 MHz band. By restricting the codefree amateurs to the 144.9 to 145.1 MHz frequency range, you force a rearrangement of existing operations to support the codefree licensee. Your proposal, in effect, disenfranchises those amateurs who presently utilize that frequency range. This is direct contradiction to your published conclusion number 1, "No licensee should lose any present privileges".

As there is extensive digital operation in the 144-148 MHz band outside the proposed 144.9-145.1 MHz codefree subband, your proposal unduly restricts the codefree licensee from participating in those activities. Further, in the case of activities which are not likely to be of interest to the codefree licensee but are presently coordinated to the codefree subband, it will place undesirable pressure on those activities to clear the subband for the codefree licensees. Certain existing situations preclude frequency changes, such as co-located voice repeaters.

NCPA takes no position on the question of whether or not codefree licensees should be allowed to operate in the 144-148 MHz band. However, should the codefree licensee be permitted any privileges in the 144 MHz band, NCPA strongly suggests that a de facto "codefree" subband not be established. Rather, NCPA suggests that codefree licensees be accorded the full range of frequencies available to the mode(s) authorized for their operation.

In our specific instance, the "TCP/IP" frequency in use in Northern California is 145.750 MHz. The TCP/IP operators polled welcome the codefree licensees and will encourage them to participate in TCP/IP activities. The DX Packet Spotting Network, however, utilizes the frequency 144.950 MHz at 5 locations. These locations are linked together and are used to announce and coordinate "DX" activities on the lower HF frequencies, where the codefree licensee would not be permitted to operate. It is expected that codefree licensees would find no attraction to the DX Packet Spotting Network. This implies a frequency swap, which would be impossible at at least one presently operating location due to co-site interference problems.

NCPA has worked in conjunction with the Northern Amateur Relay Council of California, the voice repeater frequency management group, to establish and maintain frequency coordinations that satisfy the peculiar needs of this area. We would prefer that you not impose additional constraints on our already difficult task by creating a unique codefree subband.

Respectfully,

Lew Jenkins, N6VV
President

cc: Rodney J. Stafford, KB6ZV
5155 Shadow Estates
San Jose, CA 95135

Standard Routes

NCPA recommends giving messages with these route designators national distribution. These designators should never be translated. With the exception of USA, a user should not originate bulletins using these designators unless he is specifically appointed to do so.

ARL — ARRL
USA — General Nation-wide
AMSAT — AMSAT
CRRL — CRRL
RTTYDX — RTTY DX news
ALLUS is discontinued, and should be translated to USA.

[Ed. note: Sending a bulletin to ALL @ USA consumes a tremendous amount of network resources. Most SYSOPs recommend trying a more local bulletin first. Some SYSOPs find it impractical to handle @ USA bulletins, particularly where the forwarding path is marginal or crowded, and especially on HF. It is possible that a bulletin sent @ USA may not actually be distributed nation-wide. The situation will improve dramatically with the installation of planned high-speed UHF links.]

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Frequency Coordinator's Report

Brad Watson WA6AEO

Several things are happening in the area of what NCPA is doing with regard to frequencies used for Packet Radio. First off, we have recently secured, and are now beginning to occupy spectrum on 430 MHz. 500 kHz. is available there, and plans are for it to be used for hilltop to hilltop linking (some high-speed modems), and TCP/IPers, BBSs and the DX people will be using these frequencies for backbones.

Also on the horizon is the need for super-wide bandwidth spectrum on 900 MHz. for TCP/IP, with the hope that this experimentation now will lead to resources that will be able by sheer speed to service our whole Packet community in Northern California. TCP/IP stations will soon be commencing operation on 900 MHz then, and we are coordinating this use with the Northern Amateur Relay Council so that our use of these frequencies will cause no interference to operations already in existence there.

Also under way is the compilation of a frequency list listing all stations on the air 24 hours a day on all the frequencies used for Packet coordinated by NCPA. This includes BBSs, Network nodes (NET/ROM, TheNet etc.), TCP/IP, DX PacketCluster, etc. I am probably most interested in those resources that are dedicated to full-time RACES/ARES use. This list will also help us in creating a Northern California Network Map being put together now. If you have any information for me, please send it to me, WA6AEO @ N6VV, or Brad Watson, 1080 San Miguel Rd. #27, Concord, CA 94518.

In future editions of this Newsletter, I hope to publish the NCPA Frequency List, as well as the Band Plan for Packet Radio in Northern California. I solicit any information that can help me do my job. Please talk to me. I very much appreciate the opportunity to serve our fraternity in the capacity of Frequency Coordinator for NCPA. Watch this spot for the latest news on what frequencies we have to enjoy Packet Radio with, the fastest growing trend in Amateur Radio...

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Where to Find a BBS

Ben Lomond	N6MPW	145.03
Benicia	KJ6FY-1	144.93
Berkeley	N6EEG	144.97
Carmichael	KG6XX-1	145.07, 441.50
Ceres	WB6V	145.07
Dixon	WA6RDH	145.01
Felton	N6IYA-2	145.03, 145.77
		441.50
Fremont	K3MC	145.09
Fremont	N6QMY-1	145.09
Gilroy	AA4RE-1	144.99
Hollister	KE6BX	144.93, 144.99
Lemoore	N6OA	145.09
Livermore	WA6YHJ-1	145.09
Los Altos	WB6ASR	144.93
Los Gatos	N6LDL	144.97
Martinez	KA6FUB	145.79, 441.50
Menlo Park	KA6JLT-2	144.93
Merced	K6RAU-1	145.09
North Highlands	WA6NWE-1	145.09, 441.50
Palo Alto	N6IIU-1	145.07, 223.60
Petaluma	KB6GOZ	144.97
Piedmont	WW6L	144.99
Pleasant Hill	N6VV	144.99, 441.50
Redding	WB6MIF	145.07
Richmond	WD6CMU	144.97
Sacramento	KD6XZ-1	144.97, 441.50
San Francisco	W6PW-3	144.99
Santa Cruz	KI6EH	144.91, 223.56
Santa Cruz	W0RLI-2	145.77, 223.56
		441.50
Scotts Valley	KI6EH-1	144.91, 223.56
Soquel	KB6IRS	145.09, 223.56
Twain Harte	W6FGC-2	144.97
Yuba City	KE6LW-1	145.07

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The Band Plan

144MHz band

144.91 — Kybd to Kybd
144.93 — LAN
144.95 — DXPSN
144.97 — LAN
144.99 — LAN
145.01 — Kybd to Kybd
145.03 — Kybd to Kybd
145.05 — Kybd to Kybd
145.07 — LAN
145.09 — LAN
145.71 — Digital Experimental
145.73 — 9600 baud TAPR compat.[1]
145.75 — TCP/IP
145.77 — LAN
145.79 — LAN
146.58 — DXPSN

220MHz band

223.52 — Node uplink (NBAY)
223.54 — Node uplink (EBAY)
223.56 — Kybd to Kybd
223.58 — Node uplink ("Other")
223.60 — Node uplink (SACVAL)

430MHz band

100kHz-wide channels

433.05 — TCP/IP Backbone
433.15 — NET/ROM Backbone
433.25 — DXPSN Backbone

20kHz-wide channels

433.31 — backbone
433.33 — backbone
433.35 — backbone
433.37 — backbone
433.39 — backbone
433.41 — BBS interlink
433.43 — digital experimental
433.45 — digital experimental
433.47 — NET/ROM interlink, kybd
433.49 — TCP/IP
441.50 — All

Note 1: Assigned to NCPA Technical Committee for 9600 baud network development.

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PBBS Coordination

Roy Engehausen, AA4RE

The NCPA (and its predecessor, the NORCAL SYSOPs' Association) has been successful in constructing one of the better systems for BBS access and for forwarding mail. This has been possible by encouraging both communication and cooperation between SYSOPs. This process is called "coordination".

To have your BBS in the routing tables of NCPA members, you should be "coordinated". Coordination is nothing more than letting everybody have time to comment on the addition of your mailbox to the system and to try to resolve any "disagreements" that come up.

To start the process, please drop me a note with

a) Location

b) Mailbox program name and version

c) Computer type if b) is not a standard (W0RLI, MBL, RE)

d) Port frequencies

e) Who you will be receiving your bulletins from and what frequency

f) Anything else you think may be of interest

I then publish a QST to all NCPA bulletin boards with a summary of the data and allow a comment period of a week or two. After that time, you are considered coordinated unless there seem to be unresolvable disagreements. (This has never happened yet!)

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Closed Nodes

Roy Engehausen, AA4RE

If you happen to be exploring different packet frequencies and find a new NET/ROM node that seems to be local to you, please be aware of the following:

There are *open* and *closed* NET/ROM nodes. *Open* nodes are for the use of anyone. A *closed* NET/ROM node is one whose node name starts with a # (Example: #SFO3). *Closed* nodes are special purpose nodes that should not be connected to directly by users.

The purpose behind *closed* nodes is to either provide a link between other NET/ROM nodes or between mailboxes. For example, #SFO3 connects several mountain tops together. If you were to go on its frequency and connect directly to #SFO3, you would slow the data going between #SFO3 and the nodes it connects to.

The *closed* nodes should not keep you out of the network, however. Most *closed* nodes have an associated *open* node to provide user access. In the case of the *closed* node #SFO3, the *open* node is SFO (W6AMT) on 144.93 Mhz.

We ask for your cooperation in not using a *closed* node for your initial connection into the network. By respecting the wishes of the node's owner, you show basic courtesy to another amateur and keep the data moving for all networks. If you feel there is a need for an *open* node somewhere, consider getting involved and helping to finance or operate the node.

[This note has also appeared in The Relay. — ed.]

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The Rules!

A satire by
Ed Mitchell, WA6AOD

It was a dark and stormy night. Tommy Ham sat cozily inside his ham shack, tuning slowly across the band. A faint CW signal barely rose above the static crashes of a nearby thunderstorm. Tommy copied the call carefully onto his note pad. Wow! A 78Y3.

Before calling that rare one, though, Tommy turned to his attorney, Charles Antenaman, Esq, and asked, "Charles, what's your interpretation of the rules on this one? Can I call him or not?"

"Well," said Charles, "I think we'd best check the Code of Federal Regulations, Title 47, Part 97, Subpart B, Section 97.7 Frequency Privileges. Then, we'll check the expiration date on your license, call the FCC to see if your license has any recent citations, and I'll check with the State Department to make sure that Eastern Summaxonlavia is still legal for U.S. citizens to talk to. I'll check with the Eastern Summaxonlavia Embassy in New York and make sure there aren't any problems on that end. Plus I'll need to verify your city's antenna ordinances. Your antenna is under 45 feet, right?"

"Uh, well, no, its a 54 foot self supporting tower," said Tommy.

"Oh dear! I need to call City Hall at once and get a clearance from the Building Inspector's Office. Don't touch that key. And what about your red lights?" asked Charles.

"Red lights?"

Tommy looked over at Charles quizzically, wondering what Charles could be talking about.

"Ah come on," shouted Charles. "Your tower is one foot inside distance limitation to the airport. I'm afraid you've got some real problems. Let me put this on the list of things to do: Call FAA ASAP. Okay, and you took care of the Environmental Impact Statement?"

Tommy was beginning to catch on. "Oh, ah, of course."

"Show me," stated Charles.

"Well..."

"Just as I suspected. And do you meet the ANSI guidelines for radiation exposure?," Charles sighed.

"I dunno." Tommy looked perplexed.

"Well," said Charles, "I'd guess this will take about three to five days to straighten out. Meanwhile, don't you dare call that 78Y3! So just how do you think you guys get off using the radio spectrum in this slipshod manner! Oh, and by the way, I'll send my bill at the end of the month." Charles walked to the door. "See ya Tommy. I hear there are some really good sitcoms on the TV tonight. Enjoy!"

He waved as he walked out to his Mercedes.

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A Trip To The Dayton Hamvention '89

Larry Kenney, WB9LOZ

Bill, K9AT, and I, went together to Dayton, flying on Delta, the "official airline of the Dayton Hamvention." We left on Thursday, April 27th, and flew from San Francisco to Atlanta, where we changed planes for our flight to Dayton. (I think *all* Delta flights go via Atlanta!) The flight from Altanta to Dayton was about 90% hams! The weather was perfect for the entire trip.

We arrived at our motel at 6:30, where we met friends and went out to eat before retiring for the night. Turning on our HTs, just about every channel on 2 meters was being used. Friends with 220 and 450 rigs reported that those bands were both extremely busy, too, and many more people were still arriving or due to arrive on Friday. The talk-in station was sending new arrivals who didn't have room reservations to motels 35 to 40 miles from Dayton. There definitely was no room at any inn in the nearby Dayton area if you were going to stay more than one night. They said that there are 58 hotels/motels within 25 miles of the Hamvention, and every one was booked solid for the weekend.

At 6:30 Friday morning, we were awakened by the sound of thunder and heavy rain. It was raining so hard I couldn't see across the pool in the courtyard below our room. The storm continued for close to an hour, with many huge bolts of lightning — some that seemed much too close for comfort. Turning on our HTs, we heard stories of rivers running down the highways, traffic at a standstill and one of a table floating down the hill out at the Hamvention flea market area. Although the doors to Hara Arena weren't officially open, the masses from the flea market got inside anyway to keep from getting totally drenched.

By the time we were ready to leave the motel for breakfast, the rain had stopped and the skies had begun to clear. When we got to the Hamvention site later on, the sun was shining, but parking was nowhere to be found anywhere close by. The lots weren't full, but no one dared to park in them — they were giant mud ponds full of deep ruts! Parking was available in paved lots at nearby schools and a large shopping center, but it required a walk of several blocks back to the arena.

The commercial exhibit areas inside the arena didn't open until noon so we began to wander through the flea market area. You had to make good use of your time if you wanted to see everything. The flea market consisted of 1980 spaces, each marked with a number on the pavement. Some people used only one, while larger groups took as many as 10. All you could see was a sea of people surrounding the tables, cars and trucks. There were no special bargains, but lots of the same stuff you see at the Foothill flea market — just lots more of it!

At noon we went inside to begin looking at all of the new goodies. 276 companies had exhibit space this year, filling 7 large rooms, including one the size of a basketball gym. Of course there was Kenwood, Icom, and Yaesu, Mosley, Cushcraft, Hustler and Larson, AEA, MFJ, Kantronics, Pac-Comm, DRSI, KLM, Heath, Ten-Tec, Uniden, ACC, HAL and VHF Communications. Plus the ARRL, 73, Ham Radio, CQ, World Radio, 220 Notes, W5YI Report, TAPR, AMSAT, QCWA, ATV Quarterly and MARS. But some companies you wouldn't expect were there too, like Techtronics, Hewlett Packard, and Bell and Howell. The National Weather Service even had a booth. There were *lots* of ham radio stores represented, including HRO, lots of T-Shirt, QSL card, and call badge companies, plus a large number of computer hardware and software companies. If you wanted something, I think you could have found it with no trouble at all.

From 1 to 5 on Friday, 9 to 5 Saturday and 9:30 to 1 Sunday, five concurrent seminar sessions were being held. Some lasted two or more hours, others were short half hour forums. Here's a brief list of the subjects: Packet, DX'ing, Slow Scan, Fast Scan, FCC, Wayne Green, County Hunters, Contesters, NTS, ARES, MARS, 10-10, Antennas, Weather Satellites, VHF/UHF, Home Brewing, Geratol Net, SPAM (the ones promoting AM), Repeater Coordinators, QRP, SWLs, College Radio Clubs, and some specialized forums: Inside Hurricane Gilbert, Radiation Hazards, Ham Radio and the Law, Maidenhead Grids, Ham Radio in the classroom, on-going electrical safety demonstrations, and a lot more. I think just about every facet of ham radio was discussed in the seminar program. It was excellent!

Friday night they held a big FM Bash, but we went to the HF Packet SYSOPs' dinner. Bill and I rode with Lew, N6VV and Dave, W9ZRX. Got to meet a lot of the other SYSOPs across the country. Besides Dave, we met W3IWI, N2JUP, VE3GYQ, KD5SL, WB9TYT, KH4WY, N4HY, K3RLI, K0HOA, AG3F, and N8XX who set it all up for us. The only major decision that was agreed to that evening was to stop forwarding bulletins on the 20 meter STA nets. There's just too much personal and NTS traffic to get through. We talked about several items, but it was mostly a pleasant, social evening with lots of jokes, good food and good drinks.

Saturday, we woke up to more rain. It was on and off all morning, so we spent the day inside the Hara Arena looking at the goodies. I bought a new half-card for my AT with two TNC ports on it from DRSI (for only $149!), upgrades for my MFJ and my PK-232 TNCs, plus EPROMs, connectors, and other odds and ends.

Whenever you turned on your HT at the Hamvention you'd find the entire two meter band in use, but there was so much RF floating around on Saturday that it was difficult at times to hold a conversation with someone on the other side of the hall. Your receiver would be desensed too much from the others transmitting nearby. I never did hear an official count on the attendance this year, but it was supposed to be the largest yet.

Saturday night, we relaxed and enjoyed a nice dinner and spent the evening with our friends.

Sunday was a beautiful warm sunny day, and we spent that out in the flea market until the 2 o'clock prize drawing. (Despite all the rain, we worked around it, so it didn't really bother us at all. I'm sure the ones out in the flea market all weekend have a different story to tell though. HI)

At 2 o'clock they close the exhibit area and start calling out numbers for all

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"For Sale": Just The Facts, Please

Ed Mitchell, WA6AOD

The following quote comes from the The FCC Rule Book, page 6-9, published by the American Radio Relay League, and is followed by an additional written policy statement from the FCC:

> Q. In the United States there are many nets that cater to hams selling and buying their ham radio equipment. Are these so-called "swap and shop" nets legal?
>
> A. Yes, within certain constraints. Amateurs may use their stations from time to time to discuss the availability of a piece of Amateur Radio equipment, but such activity would be limited to that of an occasional nature. It's best not to discuss price on the air. Instead, swap phone numbers with the interested party and finish the dickering off the air. Activities could not include any items of a personal nature, such as a camera or ordinary broadcast radios. Hams should not engage in regular "flea market" or business activities on swap nets so as to derive a profit by buying and selling ham gear on a regularly scheduled basis (97.112).

Direct quote from FCC PR Docket 88-139, page 5 (i.e. this is a policy statement direct from the Federal Communications Commission):

"An asking price may be mentioned, but no subsequent negotiations or bartering may take place."

> 36. Current policy permits amateur stations to transmit information about the availability of amateur radio equipment, notwithstanding Section 97.110, 47 C.F.R. Section 97.110, prohibiting business communications. In this context, amateur radio equipment is equipment normally used in an amateur station by an amateur operator. An asking price may be mentioned, but no subsequent negotiations or bartering may take place. If interest is expressed, the amateur operators should exchange mailing addresses or telephone numbers and finish negotiations using means of communication other than amateur service frequencies. Dealers may not take advantage of this exception. Amateur operators who derive a profit by buying and selling amateur radio equipment on a regular basis are considered dealers and violate the business prohibition if they use amateur service frequencies for this purpose. Proposed Section 97.219(c) codifies these policies.

The posting of "for sale" items concerning Amateur Radio equipment is completely and unequivocally legal.

Clearly, under written policy statements from both the ARRL, and the FCC, in 1988, the posting of "for sale" items concerning Amateur Radio equipment is completely and unequivocally legal, including, as stated above, the posting of an asking price. Note also that the FCC interpretation is slightly more liberal than the ARRL interpretation.

While Section 97.219(c) is a part of the proposed rules rewrite, the FCC has made it explicitly clear in this section of the NPRM that the FCC's own interpretation of the existing Part 97 is that the posting of "for sale" items, including an asking price is legal.

I urge all SYSOPs to adhere to the this "for sale" policy. There is no need to censor messages that fall within the above described categories.

[Ed. note: This article first appeared as a packet radio bulletin on April 1, 1989. In a recent conversation, Ed told me he had quite a lot of reaction to that bulletin. Many hams are of the opinion that no "for sale" item should ever give a price. Many others, quite obviously, are of the opposite opinion. Both the FCC and the ARRL have spoken, belatedly but clearly, on this issue. I join with Ed in urging everyone to buy and read a copy of "The FCC Rule Book", published by the ARRL, and available "everywhere".]

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NCPA Recommends:

Include a phone number or address with your "for sale" bulletin, and send it to SALE @ NOCAL.

Many regions, including SOCAL, refuse "for sale" items if they contain prices. Moreover, the traffic in "for sale" messages is becoming very heavy. If you do post a "for sale" bulletin for wider distribution, you should be prepared to ship the merchandise.

You may ask questions about proffered equipment by packet, but don't ask the price or negotiate or make any deals. Use the telephone or mail for that, as required by the rules.

Use the designator "SALE" instead of "ALL" or "4SALE". It is a courtesy to SysOps to use the distinctive designator. The commonly used "4SALE" causes trouble, because it can be mistaken for a zip code by certain BBS software.

/EX

***A Trip to Dayton** from page 6*

the unclaimed prizes until they're gone, so you have to be present to win. The stadium fills up fast for that!, especially when some of these regular prizes are VHF and UHF rigs, HTs, antennas, etc. When all of the regular prizes are gone, they then pick the winners of the top 10 prizes. We had to leave for the airport at 2:45, and they were still calling prize numbers for the regular prizes, so we gave our tickets to our friends. We never got a call, so we either didn't win, or they kept the prize.

In case you're interested in what the 10 big prizes were, here's a list: 1-Icom IC-781, 2-Icom IC-765, 3-Ramsey Electronics 10-100 MHz Service Monitor, 4-Kenwood TS-790A, 5-Telex TH-7DX, 6-ACC Repeater Controller, 7-Icom IC-275A, 8-Yaesu FT-747GX, 9-Heath SB-1400, and 10-Kenwood TS-680S.

So that's the Dayton Hamvention of 1989. Make your plans now for 1990. The dates are April 27, 28 and 29. See you there?

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The Inevitable Editorial

Anthony Straight, KI6HH

Welcome to the first edition of the NCPA *Download*. We owe the name of this rag to Roy, AA4RE and John, N6IYA, it's existence to NCPA, and its exemplary content to some of our fine local talent. As a matter of fact, both the journal and the institution turned out better than some of us expected. The Download will undertake to keep you abreast of unfolding developments, enabling you to comment, partake, and understand, rather than just be overtaken. That brings me to the present squib, and some advice I wish I'd been given before starting up my own BBS.

This is addressed to those of you who would like to be BBSers. Allow me the liberty of dividing you into three kinds: the user, the personal mailbox owner, and the SysOp. It seems best for a BBSer to progress through those three categories, in order, and stop when his interest, resources, and commitment dictate. He should stay a while and learn at each stage, before wading in deeper. Let us go, briefly, through the three stages.

A user is the easiest kind of BBSer to be. It is not strictly necessary to posses a computer; a "dumb terminal" will do. A user is a "customer" on an established BBS, and all it takes to become a user is a note addressed to the owner, or simply to "SYSOP". It is important to send the note: It is possible that the system has more users already than it can support, or that it does not support users. The SysOp will likely tell you where to find a suitable BBS if he cannot take you in. Check "Where To Find A BBS" in this newsletter for a list of places to start looking. Once you and the SysOp agree upon it, you are a user of that BBS, and it is your "home BBS". When you send a message, put your name and return address at the bottom. Your return address is your callsign, an "@" and the BBS's callsign; for example: 73 de Joe User, W6USR @ W6BBS.

A personal mailbox is a good way to get to know the operation of a BBS without taking on the obligation that goes

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Technical Corner

Mike Chepponis, K3MC

Howdy! Welcome the the first installment of the NCPA Technical Corner! I have been given the job of Technical Committee chair, and I want to hear what you are doing to improve the network, and to make it state-of-the-art.

By "network", I don't mean anything provincial; I mean something capable of carrying all of the traffic that we here in Northern California generate, from keyboard-to-keyboard QSOs, BBS traffic, DX spotting nodes, TCP/IP, etc. I believe through the integration of these various nodes into one network we will gain by sharing the load of building such a beast.

By "network", I don't mean anything provincial...

It is clear that I'm not talking about a 1200-baud network; only something faster will do! Toward that end, I see several higher-speed networking options becoming available shortly. In particular, there are four speeds that appear to be emerging: 9600 baud, 56k baud, .5 Mbaud, 10 Mbaud

Now a brief look at each of these ranges, and how they will be appropriate to building our network.

9600 baud

Although the HAPN modems (at 4800 baud) have been available for some time, that modem requires modifying existing rigs, and just because of that, I don't expect it to catch on. On the 9600 baud front, there are some folks experimenting with 9600 bps Rockwell FAX modem chips, running the audio into the mic jack like we currently do for 1200 baud. These chips are promising, and there is a report that the Japanese Hams have such a thing going, using KISS TNCs. It's major disadvantage appears to be the training sequence needed for this type of modem.

The other contender for 9600 baud is the TAPR PacketRadio, which was unveiled at Dayton this year. It comes in two versions, either with or without a TNC built in. So far, it is not in beta test, but I have asked to be a beta test site, and I expect several of these modems by the end of the summer. It uses direct FSK, and will fit into a standard 20 kHz channel at 9600. 19,200 baud is available, but it requires somewhat more than 20 kHz. I'm not sure exactly how much more.

This particular modem is a candidate to help us remove ourselves from the 1200 baud shackles that we now inhabit. Because it is perfectly legal to use on 2 meters, it would provide us an instant upgrade approaching 8 times the thruput for a given channel compared with 1200 baud! Not only that, since these 5-channel, crystal-controlled rigs are packet only (do not have scanning features, LCD display, keypad, tone generator, etc., that normal FM talkies have), they will sell for prices lower than most HTs!

These benefits mean that if we were to replace all of our existing 1200 baud 2 meter channels with this 9600 baud gear, we'd instantly have a network capable of handling almost 8 times as much traffic as the current network, and free up a lot of 2m FM radios as well! Therefore, it appears that converting from 1200 baud to 9600 baud will be the way to go. NCPA has recognized this, and at the last Board Meeting, 145.730 MHz was set aside as a 9600 baud channel, especially for the TAPR PacketRadio, but also for other TAPR-compatible 9600 baud designs (word is that PacComm's radio will be made compatible, for example...). Note that there is no differentiation as to mode on this frequency, that is, DX cluster operation, keyboard-to-keyboard, BBSs and TCP/IP will all be equally welcome. As our use of 9600 baud grows on 2 meters, we'll most likely ask all users which of our other packet channels can be upgraded to 9600 baud.

56 kbaud

Dale Heatherington, WA4DSY, designed and produced a beautiful 56 kilobaud radio modem. It requires only a transverter for your band of choice (220 MHz or above, where we are allowed to run that fast), a +/- 5 volt supply, and a method of connecting it to your computer. There are two ways to do that: either use a TNC-2 running KISS-56 code (using a 19.2k baud serial link to your computer), or use the DRSI PCPA packet adapter. Each of these requires

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Technical Corner from page 8

use of TCP/IP code, which was written by Phil Karn, KA9Q (and distributed by TAPR).

Phil has a 56k network set up at his home QTH in New Jersey, somewhere in the 220–222 MHz segment (sigh!); he uses the PCPA packet adapter. There are a few other areas of 56k activity, notably the greater Atlanta area (Dale lives there!), this effort being sparked by the GRAPES packet group.

In Northern California, two C.A.T.S. (California Amateur TCP/IP Society) members, N6RCE and myself, have been experimenting with 56k on 433.050 MHz. We are using Microwave Modules MMT-432s at about 8 watts output to vertical antennas. Kevin, N6RCE, is in Cupertino, and I am in Fremont, so our path is not as good as we'd like with such low powers. (Remember that the 56k modems require a 70 kHz bandwidth for a -26dBc signal, and so that 8 watts is spread over 70 kHz.)

So far, Kevin has been able to receive my signals, and I have been able to see his only if I use a GaAs FET preamp, so we still need to do some work on the RF part of it. The good part is that the 56k modem kits, which have 3 boards (RF, encoder, and decoder) go together quickly and are easily aligned. The downside is that this project is not for the faint of heart. Building up working 56k modem "systems" requires chassis drilling, power supply construction, wiring cables, interfacing to new software, etc.

So, my prognosis on 56k is that — when it becomes available completely assembled and aligned and ready-to-go — it will be the way for medium-speed networks, and will be especially important in the 420–440 MHz segment, multicast environment. But we're not quite there yet...

.5 Mbaud

Glenn Elmore, N6GN, is working on a 500 kbaud radio for 902/1200 MHz. He has some things working currently, is now getting ready to build enough of them to prove the design. The prototypes run on either of two band segments, 903–905 MHz or 915–917 MHz (which were recently allocated by NCPA specifically for this purpose). Again, by the end of the summer, we expect to have more information available about these modems. The best news about this is that the radio parts cost will be about the same as a TAPR 9600 baud radio!

10 Mbaud

N6GN, together with Bdale Garbee, N3EUA, are working on "Ethernet" on the air using microwaves at 10 GHz. Bdale demonstrated this at Dayton, running at around 4 megabits/second. There is still work to be done, and this stuff is clearly strictly point-to-point, but the results are so far are quite encouraging!

The Digital Side

One of the problems with these faster approaches, especially above 19,200 baud, is a convenient way to get the bits into/out of our computers. That is exactly the problem I set about solving last year, with a special I/O card that one would plug into an IBM PC/XT/386 box (or use over AppleTalk with a Mac), and would allow at least 4 full-duplex channels to run at speeds up to 56k, or 2 channels running full-duplex at 500 kbits/sec. My card uses a V40 microprocessor (which is the same micro used in the MicroSats), at least 2 Zilog 85C30 chips, and at least 256k of DRAM memory. It has a few other features, but, alas! it is not quite ready to see the light of day. If all goes well, however, expect to see it, too, near summer's end. Phil Karn has the original prototype wire wrapped board, and is currently writing code for it. (Oh, the V40 is binary compatible with the 80x86 family of microprocessors, which makes it easy to develop code.)

Satellites

Expect to see quite a few new birds flying by year's end. Early in November is the latest launch date for the microsats. These "flying mailboxes" are currently undergoing software specification for ground station access, and that is likely to be firmed-up shortly. The nice thing about these birds is that it will be possible to upload new code to them, so we'll be able to get them to do just what we need. It is currently envisioned to be an extension to the BBS world wide forwarding network. Access will be at 1200 baud (initially), with Manchester encoding on the uplink on 2 meters, and PSK on the downlink on 70 cm. TAPR sells the modem required to access the microsats (which, incidentally, was designed for Fuji-OSCAR-12, and has the same data formats). These microsats are designed to have a positive power budget, so they should be available twice a day, at approximately the same time of day, for about a 20-minute pass each. Exciting stuff! More details in the next newsletter!

Your Input, Please!

Hey, this is just the stuff that I know about happening here in Northern California. Please share with us what you are up to, and your views on a variety of technical subjects. If you want, we can arrange for you to write a guest column here. If you have news of other developments, or questions, or whatever, please send them along. I can be reached at any of the following:

K3MC @ K3MC — WestNet BBS [44.4.1.164] — TCP/IP, 145.750 MHz
k3mc@apple.com — Internet
...!apple!k3mc — uucp (usenet)
415/438-9492 — Ma Bell

Vy 73, and I'm looking forward to hearing from you!

—Mike, K3MC

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Drumroll, please...

Announcing the winners of the "Name That Rag" contest. Selected by ***an impartial jury*** comprising attendees of the recent board meeting, the ***two*** winners are:

John Smith, N6IYA

Roy Engehausen, AA4RE

For naming this rag:

The "Download"

(applause)

ARES/Hazmat A Hazardous Chemicals Database Accessible by Packet Radio

Weo Moerner, WN6I and Dave Palmer, N6KL

Some of you may be aware of the hazardous chemical information that many firefighters and emergency service workers use to identify chemicals that may be spilled on the roadway (The Emergency Response Guidebook). Basically, vehicles that transport a hazardous chemical are required to label the vehicle with a placard containing a four-digit placard number for identification purposes. Usually, if a spill is seen (from a distance) the procedure is to read the placard number through binoculars, and then look up the information for that placard number. For each placard number there is a chemical name and a guide number that identifies the proper response for that class of chemical. Normally, firefighters look up a placard number in an Emergency Response Guidebook that they must carry around with them.

Recently, a group of Michigan hams entered the entire hazardous chemical list of placard numbers, chemical names, and guide numbers into a set of computer files. It is possible to search through the information by downloading all or a portion of these files, but it would be even better to let a remote host computer do the searching and to allow access to the hazardous information via packet radio.

Hence, ARES/Hazmat! ARES/Hazmat is a specific revision of the ARES/Data program configured specifically for the standard hazardous chemical information. ARES/Hazmat was written by WN6I, Weo Moerner, and N6KL, Dave Palmer, and is available for use by anyone with an IBM PC or compatible and a WA8DED TNC (1, 2, or PK-87). The database built in to ARES/Hazmat contains one entry for each chemical: **Field 1** is the placard number for the chemical, **Field 2** is the guide number for that chemical, **Field 3** is as much of the chemical name as can fit into 40 characters, and **Field 4** is special evacuation information (not available for all chemicals). The automatic remote searching capabilities of ARES/Data allow a remote packet operator to search for a placard number, determine the chemical name and guide number, and download a guide number file for more details.

For example, if placard number 1234 is desired, the packet operator connected to ARES/Hazmat types "`/1,1234`" to search for placard number 1234 in field 1. The response from the database might be;

```
Placard Number, Guide Number, Chemical Name,     Evac. Info.
1234,           34,           trichloromethane, SM 300 ft LG 500 ft
```

which means that the chemical is trichloromethane, the guide number is 34, and for small spills, the area should be evacuated for 300 ft and for large spills the area should be cleared for 500 ft. Then the operator can type "`get guide34`" and the complete text of instructions and information for chemicals with guide number 34 will be sent to the packet operator.

To find a chemical name if only the first few letters are known, the operator can search on Field 3 with a wild card. For example, to find all chemicals starting with "dichloro", the operator types "`/3,dichloro*`" and the ARES/Hazmat system will send the information on all chemicals in the database starting with "dichloro".

Like ARES/Data itself, ARES/Hazmat contains a full-featured conference bridge, so that all connected stations can talk to one another.

ARES/Hazmat is running in beta test mode at various times on 145.03 MHz, callsign WN6I-4. The complete program will soon be available on two 3 1/2in. 720 kB diskettes from W. E. Moerner, WN6I, 1003 Belder Drive, San Jose, CA 95120.

Weo Moerner, WN6I@KB6OWT (TCP/IP: weo@wn6i)
Dave Palmer, N6KL@KB6OWT (TCP/IP: dave@n6kl)

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Official Land Line BBS

Dennis Humphrey, WA6RDH operates a well-known land line BBS in **Dixon, CA**, and has graciously offered to be the "Official NCPA Land Line BBS". His system carries the latest releases of all the major BBS software, and much more besides. Call in and have a look. The number is
(916) 678-1535

Ted Mieske, KB6IUY in **Santa Cruz** operates the "Ocean Breeze" land line BBS and plans to carry Ham Radio software. Definitely worth a call at **(408) 426-6815.** — 300 to 2400 baud — 8, n, 1

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In Future Editions of The *Download*

- BBS and NET/ROM network maps.
- Modifying your rig for 430 – 440MHz.
- How WP really works.
- The right way to send NTS and MARS traffic.
- Interviews with famous Packeteers.
- A survey of lightweight satellite technology.

TCP/IP

Advanced Amateur Radio Packet Technology

Dewayne Hendricks, WA8DZP

Overview

The KA9Q Internet Package is currently the most common TCP/IP implementation in use in amateur radio today. The software supports the IBM PC and clones, the Apple Macintosh, the Commodore Amiga, and both the BSD and System V UNIX variants. The package provides IP, ICMP, TCP, UDP and ARP Internet protocols as basic services, and implements the FTP, Telnet and SMTP protocols as applications. This article reviews the basic protocols used by the package.

The KA9Q Internet Package supports the IBM PC, Macintosh, Amiga, and both BSD and System V UNIX

TCP/IP Review

The Transmission Control Protocol/ Internet Protocol (TCP/IP) is a de facto standard for communications between heterogeneous computers and networks. TCP/IP development began in 1974 and the protocol specifications were adopted by the Department of Defense in 1978. Since then, TCP/IP has become the most widely accepted solution to the problem of interoperability among diverse computers.

Because TCP/IP is a requirement for interfacing to the Defense Data Network, all Department of Defense suppliers, contractors, and sub-contractors must be able to demonstrate TCP/IP support in their products. TCP/IP is also widely used in engineering and university communities, and is a requirement in those markets.

TCP/IP is the only fully-specified protocol family available today for heterogeneous computers. The International Standards Organization's Open Systems Interconnect (OSI) protocols are still being worked on. IBM's System Network Architecture and Digital Equipment's DECnet are very powerful networking implementations, but are not available for a heterogeneous set of products. TCP/IP, on the other hand, is fully defined and widely used in a variety of networking environments with computers of many different types.

Although TCP/IP predates the OSI model, it nonetheless partially conforms to the OSI layers of networking functionality. This conformity is true in part because the International Standards Organization (ISO) used TCP/IP as a model for their OSI paradigm.

TCP/IP Protocols

TCP/IP is a family of protocols that allow computers to share resources across an internetwork. Because TCP (Transmission Control Protocol) and IP (Internet Protocol) are the the best known of the protocols, the whole family of protocols is referred to as TCP/IP. However, there are a number of other protocols in the family. Each of the major TCP/IP protocols is described below.

TCP/IP is a family of protocols

Internet Protocol (IP)

The Internet Protocol (IP) is the fundamental protocol of the family and handles routing datagrams based on destination address. It allows for the interconnection of multiple networks by routing datagrams across network boundaries when necessary. Datagrams can get routed through Ethernet segments, serial lines, phone lines, or radio and satellite links.

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with it. If you own a computer, you can have a personal mailbox. My suggestion about software is that you get (for free) a copy of one of the popular BBS programs, so that you will learn more about what a BBS is and does. It is also possible to use "mailbox" software that comes with some TNCs.

A personal mailbox owner differs from a user in that his mail is automatically forwarded from his "home BBS" to his mailbox at home. Your return address is the same as for a user, and, in fact, you are a user on your "home BBS" (not your mailbox at home!). Instead of checking in and reading your messages "on the air", however, now you can read them without checking in. This is quite a bit more efficient, and requires only an agreement with the BBS SysOp to forward your mail to you. You may also have bulletins forwarded to you if you and your local SysOp find it desirable. You may wish to set up automatic forwarding of everything left on your mailbox to the BBS. A word of caution: You will likely have occasional check-ins to your mailbox! If you are set up to forward "everything", then these checkers-in can leave messages for forwarding, but don't agree to handle messages to users on your own system (i.e. to become a "home BBS" to them) unless you are prepared to become a SysOp!

A SysOp is one who operates a BBS that accepts users. Sometimes these are called "full-service" BBSs. Setting up and operating a full-service BBS is a thing that can't be done well by a "lone wolf", or by the inexperienced. Many users, perhaps hundreds, will come to depend upon your station. This means that you must dedicate reliable equipment, including a computer, radio(s), TNC(s), antenna(s) and so on full-time to the service of your BBS. To do a good job managing your BBS will require about an hour each day (after you learn what you're doing!). You will also become a "home BBS" to others, which means the callsign of your BBS must be entered (by hand, usually) into the forwarding tables of many other BBSs. (This is a part of the obligation you take on as a BBS operator: Each message to an unknown destination requires research on your part, and editing of your routing tables.) Within NCPA this process is made much easier through the "Coordination" function, presently being performed by Roy, AA4RE. (See "Coordination" in this issue.) I won't try to tell you how to be a BBS SysOp, except to say that you don't want to jump in there right at first.

That's about it: To get started, you can be a user or have a personal mailbox quite easily. Check the list of BBSs in this issue, and talk with the SysOps. Rare is the SysOp who won't help you out. Hold off declaring your station a BBS until you're sure you want to be a SysOp! when you're ready to run a full-service BBS, start the ball rolling with a message to the BBS coordinator.

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TCP/IP from page 11

IP is often referred to as a connectionless delivery system because IP routes each datagram separately. When IP receives a sequence of datagrams from a higher-level protocol, IP routes each datagram in the sequence individually. That is, each datagram in the sequence may, or may not, travel over the same path to the same destination. The IP service makes a best-effort attempt to deliver all datagrams, but if some datagrams get lost due to network hardware problems or resources that are overloaded, higher-level protocols, not IP, will retransmit the datagrams.

Connectionless can also describe the logical view of an IP internet. Hosts and gateways on the internet all operate autonomously, routing and delivering datagrams without any coordination with the original sender. Though nodes on the internet are connected physically in various ways, users see the internet as a single virtual network where the physical connections are irrelevant.

IP also defines the format of a datagram. The general format is a datagram header, followed by a data area. The header includes such fields as version of the IP protocol, length of the header, checksum for the header, total length of the datagram, and the source and destination IP addresses.

Three fields in the datagram header control fragmentation and reassembly of datagrams. IP can be used with many different physical network implementations, each of which can specify a different maximum size for physical data frames. On some physical networks, IP datagrams must be fragmented to fit into one physical data frame. IP handles fragmenting and reassembly of datagrams, using data in the fragmentation fields of the header.

The time to live (TTL) field in the IP header controls how long a datagram is allowed to remain in the internet system. The sender of a datagram sets this field. Each gateway along the path from source to destination checks the time remaining and discards the datagram when the TTL value reaches zero. This feature prevents datagrams from travelling around the internet forever, should the routing tables be temporarily corrupted.

The data portion of an IP datagram is used by IP to forward information passed to it from higher-level protocols, such as the TCP header and data. One field in the IP header specifies which protocol is used in the data portion of the IP datagram.

Internet Control Message Protocol (ICMP)

The Internet Control Message Protocol (ICMP) is used for error messages intended for the IP network software, rather than any particular user program. For example, a gateway might send an ICMP datagram to inform another gateway that a subnetwork or a node on a subnetwork is unavailable.

ICMP is used for error messages to IP network software

Because the IP internet is a connectionless system, gateways and hosts route datagrams without coordinating with the original sender. This works fine except when a problem delivering a datagram occurs. Problems occur when nodes or whole networks become disconnected, the time to live counter expires, or gateways become too congested to process more traffic. ICMP is used to send messages about these and other error conditions.

ICMP is also used for testing the reachability and status of destinations. A host or gateway sends an ICMP echo request message to test whether a destination is alive. Machines that receive echo requests must reply with the exact same data that was sent to them.

ICMP is a required protocol for any internet that uses IP. IP routing will not be successful unless ICMP is used for reporting unexpected circumstances. ICMP messages travel across the internet in the data portion of IP datagrams. The IP software on the destination machine processes the ICMP messages; they are not sent to higher-level protocols.

Transmission Control Protocol (TCP)

The Transmission Control Protocol (TCP) ensures reliable stream-oriented communications between cooperating processes. Because TCP calls on IP's services, these processes can exist on machines on different networks.

In keeping with the layered approach to networking, most systems that support TCP/IP provide a software interface to the TCP functions, allowing application programs to set up sessions with cooperating processes, listen for requests for sessions, send and receive data, and close sessions. The Application Program Interface (API) to TCP varies from machine to machine.

The Transmission Control Protocol (TCP) ensures reliable communications.

Once a session has been established, the upper-level application channels continuous streams of data through TCP for delivery to its peer process. TCP puts this data along with any necessary control and addressing data into units called segments, and then passes the segments to a lower level protocol, usually, but not necessarily IP. (TCP is flexible enough to handle a variety of underlying delivery systems.)

IP puts the segments into datagrams and sends them across the internetwork. TCP, on the other end, checks for errors, acknowledges error-free segments, and reassembles the segments for delivery to upper-level applications.

TCP maintains data transmission reliability by using a positive acknowledgement with re-transmission (PAR) mechanism. A sending TCP re-transmits a segment at timed intervals until a positive acknowledgement is received. TCP uses a checksum to detect segments that may have been damaged in transit. Damaged segments are discarded without being acknowledged. (Note, TCP and IP have separate checksums. TCP's checksum verifies segments; IP's checksum verifies its header.)

To maximize reliability and efficiency, TCP uses a concept known as a sliding window. With a simple PAR mechanism, there will be a delay in sending a new packet until an acknowledgement for the previous packet has been received. To avoid this delay, sliding window protocols allow the sender to transmit multiple packets before waiting for an acknowledgement. As each acknowledgement for each packet sent is received, the window moves forward and a new packet can be sent. The maximum number of packets that can be sent before an acknowledgement has been received is called the window size.

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To further enhance reliability, TCP has a flow control mechanism that allows the receiving end to specify how much data it can receive at the present time. When the receiving end sends an acknowledgement, it also advertises how much data it is prepared to accept on the next transmission. The sending node's window size may vary based on how much data the receiving end can accept.

User Datagram Protocol (UDP)

With the User Datagram Protocol (UDP), user processes can send and receive data across the network without the error checking or session management facilities of TCP. This avoids the overhead involved with establishing and maintaining an active and error-free TCP session.

UDP is often used for transporting unknown protocols. For example, when UDP is used to transport Apple's AppleTalk protocol data on a DEC Ethernet-based internetwork, the AppleTalk data can get passed through the DEC Ethernet nodes that don't understand AppleTalk, and eventually reach a node that does understand it.

Another important feature of both UDP and TCP is that they have the ability to distinguish among multiple destinations within a given host computer. The existence of a port number allows UDP and TCP users to distinguish among various applications on one machine, such as file transfer, remote job entry, and echo. In addition to the data sent by a user process, each UDP or TCP message includes an identifier, called a port number for the destination and source processes. By convention, some port numbers are reserved for well-known processes. These include FTP, Telnet, name server, and authentication service.

Routing Information Protocol (RIP)

The Routing Information Protocol (RIP) is a protocol used by gateways for exchanging network routing information. It is mainly intended for local networks, such as networks on a university campus. It was not intended for use on large, long-haul internets, though some large internets do make use of it today. The most widely used version of RIP is the Routed software that is released with the 4.2BSD UNIX system. An implementation of RIP has been done for the KA9Q Internet Package, but it is not widely available.

RIP is used by gateways to periodically broadcast their current routing database to neighboring gateways. Routing databases comprise a list of network addresses, and, for each network, the address of the next gateway to which to send datagrams for that network. When RIP messages are received, routing databases are updated if the RIP message gives newer information about the shortest path to a network.

The Routing Information Protocol (RIP) is ... for exchanging routing information.

Telnet

Telnet is an applications-level protocol that makes a terminal on one computer appear to be directly attached to a remote computer on the internetwork. It can also make a personal computer act as a terminal to remote hosts. It is usually implemented as server software on a host that accepts requests from remote hosts, and local user software that interacts with the user at the local terminal.

Note: Telnet should not be confused with Telenet, a vendor of commercial networking services.

File Transfer Protocol (FTP)

The File Transfer Protocol (FTP) supports the transfer of files ...

The File Transfer Protocol (FTP) supports the transfer of files between nodes on the internetwork. Like Telnet, FTP is usually implemented as a pair of server and user processes, where the server process handles requests from remote users to store and retrieve files, and the user process interacts with a user at a terminal. FTP options include choices between ASCII and EBCDIC, text and binary, and various transfer modes.

Simple Mail Transfer Protocol (SMTP)

SMTP is electronic mail.

As its name implies, the Simple Mail Transfer Protocol (SMTP) is a mechanism for transferring electronic mail among users on the internetwork. The protocol specifies the commands necessary to send mail, and is used with a standard that specifies the following general structure of a mail message: a group of header lines, a blank line, and the body of the message. Messages are sent as net ASCII, meaning the ASCII character set is used, with a carriage return/linefeed to delimit lines.

SMTP is a simple mechanism that lets a user add mail to another user's mail file. There are some problems with this in a microcomputer environment, because the SMTP mail software expects to be able to open a connection to the addressee's computer. A microcomputer might be busy doing something else, or could be turned off. For this reason, mail is normally handled by a larger system, and microcomputer mail software becomes a simple program that retrieves mail from a mail server and presents it to the user. The Post Office Protocol (POP) is used for communicating between the microcomputer mail program and the server program.

Internetwork Naming and Addressing

This section gives a detailed description of the internetwork naming and addressing concepts.

Internet Addresses

Each computer on the internetwork is assigned a unique 32-bit internet address. This address has a network part and a host part. The Network Information Center (NIC) located at SRI International assigns the network part of the address, but each organization is allowed to assign host IDs within their network. In actuality, NIC only assigns network IDs for networks that will be part of the Defense Advanced Research Projects Agency (DARPA) Internet. Organizations can assign their own network IDs, if they are sure they will not want to connect up to the DARPA Internet, often referred to as The Internet.

There are three classes of internet addresses class A, B, and C. These classes specify how much of the 32-bit address is used for the network ID, and how much is used for the host ID. Class A addresses are used for the few networks that have a very large number of hosts. Class A ad-

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TCP/IP from page 13

dresses consist of one class identifier bit, 7 network identifier bits, and 24 host identifier bits. Class B network addresses are used for intermediate size networks. Class B addresses consist of two class identifier bits, 14 network identifier bits, and 16 host identifier bits. Class C addresses are for the large number of small networks, where there are not many hosts per network. Class C addresses consist of three class identifier bits, 21 network identifier bits, and 8 host identifier bits.

Internet addresses are usually written or spoken about in dotted decimal notation. This notation is a way of simplifying the expression of a 32-bit number. The internet address is written as four decimal integers separated by periods, where each integer represents the decimal value of one octet (or 8 bits) of the address. (Eight bits are referred to as an octet in the internet world, since not all hosts use 8 bit bytes.) For example, the 32-bit internet address

10000000 00001010 00000010 00011110

is written in dotted decimal decimal notation as

128.10.2.30

Amateur Radio has been assigned a Class A address of the form 44.0.0.0. Every amateur radio operator is entitled to at least one IP address. IP addresses may be obtained from a local ham who has been designated as their local IP address coordinator.

Subnetwork Addressing

The original design for internet addressing was developed when network nodes were expensive mainframe computers, and internets were made up of relatively few nodes and networks. The designers didn't foresee that the number of networks would grow exponentially due to the proliferation of inexpensive personal computers. The original internet addressing scheme cannot manage large numbers of networks. Immense administrative overhead is required to manage many network addresses, and the routing tables in gateways become extremely large.

The solution to this problem is to minimize the number of network addresses without destroying the original addressing scheme. Subnetwork addressing (usually called subnetting) is a method that allows multiple physical networks to share one internet network address. Proxy ARP is another method, which is described following the discussion of standard ARP.

Subnetting allows multiple physical networks to exist in a site that has only one network address assigned to it. The rest of the internet isn't aware that the network address is used by more than one network. Traffic comes into the site via a gateway that routes the traffic to the multiple physical networks. IP addresses are traditionally divided into a network part and a host part. With subnetting, however, the address can be seen as a network part and a local part. Individual sites can divide the local part as is appropriate for their configurations. Some sites have chosen to subdivide the local part of its network address into an octet used for the physical network ID and an octet for the host ID.

Subnet Masking

To specify which parts of an address are for the network ID and which parts are for the host ID, subnet masking is used. Bits in the subnet mask are set to 1, if the corresponding bit in the internet address is part of the network address. Bits in the mask are set to 0, if those bits in the internet address are part of the host identifier. For example, the 32-bit subnet mask

11111111 11111111 11111111 00000000

specifies that the first three octets identify the network and the fourth octet identifies a host. The standard does not require that 1s be contiguous, but most sites prefer contiguous subnet masks for simplicity. Subnet masks are usually written in dotted decimal notation.

The subnet mask must be known by all nodes on the subnets sharing one internet network address.

Domain Names

Although dotted decimal notation is preferable to referring to hosts with 32-bit numbers, most users prefer to use alphanumeric mnemonic names for host computers. Thirty-two bit addresses are used by IP because they provide an efficient, compact representation for specifying source and destination addresses. However, the TCP/IP designers recognized that most users would not want to refer to host computers by long strings of numbers. The naming scheme used by the internet is called the Domain Name System.

The Domain Name System is a hierarchical naming scheme. A hierarchical scheme has the advantages that it accommodates a large, rapidly growing set of names, and it distributes responsibility for assigning parts of the name. A domain name consists of a sequence of subnames separated by periods. The first part of the name is the most local name, or what would be considered the leaf node of the hierarchy. For example, the domain name "cs.purdue.edu" is used for the computer science department host computer at Purdue University, which is an educational facility. An example of an amateur radio domain name is "wa8dzp.norcal.ampr.org". This is the name of an amateur TCP/IP packet station in Northern California.

Name servers are used to manage the mapping of domain names to internet addresses. Databases are kept on a small number of name server systems and are accessed by other computers over the network. Client software, called the name resolver, contacts a local name server to request the mapping of a domain name to an internet address. If necessary, that name server contacts other name servers to get the full address, and responds to the client with the address.

Every domain that has authority for naming is required to operate a domain name server that meets Internet standards. Authority for naming on the DARPA Internet is granted by the Network Information Center (NIC) located at SRI International. NIC maintains names at the higher levels, and various institutions maintain names at the lower levels. The top level can be one of a small set of names, such as edu, gov, mil (military), or com (commercial organizations).

Address Resolution Protocol (ARP)

The Address Resolution Protocol (ARP) is used to determine Ethernet addresses of nodes on a subnetwork connected via Ethernet. At the lowest level, machines must know each other's physical network addresses to communicate. Using ARP, a machine can find the Ethernet address for a given internet address. Other schemes exist for non-Ethernet networks. The KA9Q Internet Package uses ARP to map IP addresses to amateur callsigns which are used to send packets over AX.25 links.

A cached ARP table is kept on most nodes for translating 32-bit internet addresses used by TCP/IP into Ethernet addresses. If there is no entry in the table for the IP address in question, then the Address Resolution Protocol is used to send a broadcast request that essentially says "Hey, give me the Ethernet address for the host whose IP address is 128.6.4.7." Each system listens for ARP requests, and if it sees an ARP request for itself, it responds with its Ethernet address.

Reverse Address Resolution Protocol (RARP)

The Reverse Address Resolution Protocol (RARP) is used to find your 32-bit internet address, if it hasn't been statically assigned. It is very useful for diskless workstations which have no place to store a static address. It is also used in software intended for naive users who may not want to enter a 32-bit internet address. The node that wants to find its internet address resorts to physical addressing temporarily and sends a broadcast looking for a RARP server. A RARP server replies, including in its reply the internet address of the requester. RARP can also be used to find the internet address of a third party. This protocol is not supported by the KA9Q Internet Package.

Bootstrap Protocol (BootP)

The Bootstrap Protocol (BootP) is another method for a node to find its 32-bit internet address, in particular, at boot time. Using BootP a diskless client machine can discover its own IP address, the address of a server host, and the name of a file to be loaded into memory and executed. The client uses UDP and IP to broadcast a boot request packet. A server answers with a boot reply packet. This reply will contain the client's IP address, a fully qualified path name of a file to be used by the requester in booting, and other information depending on the implementation.

When the client gets the name of the file to use in its booting, the client uses a file transfer protocol to request that file. Usually the Trivial File Transfer Protocol (TFTP) is used. TFTP is a simpler version of FTP and is appropriate for diskless workstations, where the implementation will be in ROM. If the client does not need a file, the server will have a null file name in its database record for that client.

continued on page 17

Your Invitation To DXPSN

Jay O'Brien, W6GO

Over 500 amateurs in Northern California and Northern Nevada have participated in the newest application of Packet Radio, the "DX Packet Spotting Network" (DXPSN).

Amateurs who "chase" DX and who participate in contests (usually, but not always, below 30 MHz.) have found this new system to be useful in spotting "new ones". The DXPSN is not the "hobby" itself; rather, it is used to facilitate DXing and Contesting.

The DXPSN is not the "hobby" itself; rather, it is used to facilitate DXing and Contesting.

The software is written by Dick Newell, AK1A, of Pavillion Software. Dick received the main achievement award (for his contribution to DXing through PacketCluster) at Dayton's DX dinner, organized by the South West Ohio DX Club, attended by over 600 DXers from around the world. PacketCluster is featured in the May 1989 Japanese "CQ" magazine, and is also in use in several European countries.

Chuck Strobel, K6PBT, has been an invaluable "deputy" on the W6GO node. He has provided help to many new users of the system while I have been busy beta testing new software for AK1A. As a result, Chuck is very familiar with the questions asked by new users of DXPSN. Chuck has prepared a getting started article "The DX Packet Spotting Network, aka The DX PacketCluster" and several helpful "cheat sheets" which follow this introduction.

"Packeteers" are invited to connect to the network and see what it is all about.

"Packeteers" are invited to connect to the network and see what it is all about.

continued on page 17
"Invitation To DXPSN"

The DX Packet Spotting Network

aka The DX PacketCluster

Chuck Strobel, K6PBT

It will be almost a year since the DX Packet Spotting Network made its debut in the Northern California area. What is the DXPSN? Most of us are familiar with the many 2-meter repeaters, some of which specialize in performing certain functions, as does W6TI/R on 147.36, the DX spotting repeater of the Northern California DX Club. Along this same function the DXPSN, or DX PacketCluster, is a cluster of stations connected to a local node which is connected to other nodes via a UHF link. These stations are performing quietly and faster what is being done on voice.

DXPSN Nodes

Serving Northern California and Reno

KI3V	144.95	Reno
W6GO	144.95	Rio Linda Sacramento
W6LEH	146.58	Modesto
K6XJ	146.58	Clovis Fresno
WB2CHO	144.95	Santa Rosa
K6LLK	144.95	Mountain View
W6OAT	146.58	Redwood City
KN6J	146.58	Los Gatos

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The advantages of using packet for DX spotting do not outweigh voice in its entirety, but provide advantages not found on voice: less repeating, and most important, the recovery of desired information. Just a soft beep alerts you to the presence of DX, etc. You may review by inquiring of the database who was on and where, and other DX tidbits. Search by call, band, or special comment. Check current WWV propagation, user/system statistics, MUF, Sunrise/set, etc. If you're not able to stay connected continuously, this data is there for you to look up at a later time. It even has personal mail message capability along with bulletin and general information files to view.

The DX PacketCluster software allows a large conference of stations, all interested in a common function — DXing! The software author, AK1A, has designed a super package and others are developing logging and contest software to work in conjunction with this network, for a fully automated DX station for everyday use or during a big DX contest.

If you're interested in DXing, please log on and check us out. If you do, here are some operating hints for you to get the best use from the node you may connect to.

If conditions are 100% all nodes are usually connected and there may be up to 50, 70 or 90 stations linked at any given time. When on either of the 2 DXPSN frequencies, turn off your beacon and reduce your "check" polling to, perhaps, 90. Avoid any personal connects on the node frequency. By reducing all meaningless transmissions to a minimum or zero, it will help keep all the important DX and other announcements get relayed quickly without retries.

Connect just as if you were connecting to a packet friend or packet BBS. You will be greeted by the node's Welcome Message. To view a quick summary of help, just enter HELP or ?. To get you started, we've included a list of the commands in this issue. You may never use any; you may just want to monitor for the DX to appear on your screen! All commands have a short syntax version.

If you like what you see and plan on being with us often, setting a few parameters with your name, QTH, etc.

continued on page 17
"DX Spotting Network"

DXPSN Command Reference

This handy list of DXPSN node commands, compiled by Chuck, K6PBT, deserves a place right there next to your packet rig. The most-often used commands are shown in **bold face.**

DXPSN Command	Short Form	Command Explanation
ANNOUNCE	A msg	Make A General Announcement
ANNOUNCE	A/call msg	Make An Announcement To Local Users
BYE	**B**	**Leave The System — Log Off**
CONFERENCE	CONFER	Enter Conference Mode
DELETE	**DE msg#**	**Delete A Mail Message**
DIRECTORY	DI	Display Last Five Mail Messages
DIRECTORY/ALL	DI/A	Display All Active Mail Messages
DIRECTORY/BULLETINS	DI/B	Display All Bulletin Mail Messages
DIRECTORY/NEW	**DI/N**	**Display All New Mail Messages**
DIRECTORY/OWN	DI/O	Display Mail To Or From You
DIRECTORY/nn	DI/nn	Display Last nn Mail Messages
DX	**DX fq call cmt**	**Announce A DX Station**
HELP or ?	H or ?	Brief Command Summary
READ	R	Read A Mail Message To You
READ	**R msg#**	**Read A Specific Mail Message**
REPLY	REP	Reply To A Read Mail Message
REPLY/DELETE	REP/D	Reply To A Message And Delete It
SEND	**S call**	**Send A Mail Message To Call**
SEND/COPY	S/C call	Send A Copy Of Mail Message
SEND/PRIVATE	S/P call	Send A Private Mail Message
SET/ANSI	SET/A	ANSI Escape Sequences Accepted
SET/HERE	SET/H	Specify You're Available
SET/LOCATION	SET/L	Enter Your Latitude/Longitude
SET/NAME	SET/N	Enter Your Name
SET/NOANSI	SET/NOA	ANSI Escape Sequences Not Accepted
SET/NOHERE	SET/NOH	Specify You're Not Available
SET/QTH	SET/Q	Enter Your City/QTH
SHOW/ARCHIVE	SH/AR	Show Archived Files
SHOW/BULLETINS	**SH/BU**	**Show Bulletin Files**
SHOW/CLUSTER	SH/CL	Show Number Nodes/users
SHOW/COMMANDS	SH/COM	Show Special Commands
SHOW/CONFIGURATION	SH/C	Show Nodes And Users Connected
SHOW/DX	**SH/D**	**Show Last Five DX Announcements**
SHOW/FILES	SH/FI	Show Normal Files
SHOW/HEADING	SH/H prefix	Show Beam Heading To A Country
SHOW/LOCATION	SH/LOC call	Show Latitude/longitude Of User
SHOW/LOG	SH/LOG	Show Last Five System Log Entries
SHOW/MUF	SH/MU prefix	Show MUF To Country
SHOW/NOTICE	SH/N	Show Local Node Notice
SHOW/SUN	SH/SU	Show Sunrise/sunset For Country
SHOW/USERS	**SH/U**	**Show System Users**
SHOW/USER	SH/U CALL	Show Name/QTH Of User
SHOW/VERSION	SH/V	Show Version Of Software
SHOW/WWV	**SH/W**	**Show Last Five WWV Announcements**
TALK	T call	Enter Talk Mode To A User
TALK	**T call msg**	**Send A One-Line Message To A User**
TYPE	**TY file**	**Display A File In Bulletin Area**
TYPE/nn	TY/nn	Display nn Lines Of A Bulletin File
TYPE/FILES	TY/FI file	Display A File In Files Area
TYPE/FILES/nn	TY/FI/nn file	DIsplay nn Lines Of A General File
UPLOAD/BULLETIN	UP/BU file	Upload A File To Bulletin Area
UPLOAD/FILE	UP/FI file	Upload A File To General Files Area

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DX Spotting Network from page 15

will personalize some database outputs for you. To set your name for example, SET/NAME Chuck. Next set your QTH as SET/QTH Lockeford. You may even include your whole address if you wish. By setting next your latitude/longitude, you can get specific information on another user's location from your QTH, MUF propagation, Sunrise/set times of a DX location. Enter SET/LOC, then enter your latitude/longitude in the format given. Should you enter any command errors, an error message will be sent back, and in some cases the correct format to use.

Couple more guidelines. Be sure to maintain a healthy signal to the node you're connected to. Read bulletins during non-busy DX periods. Help yourself, and others stay connected. Weak signal and related retries only reduce network performance. Keep the DX traffic moving smoothly. If you can hit two nodes on the same frequency, select one and put up a Yagi aimed at that one, so that you will not interfere with the other.

This covers briefly what the DX Packet Spotting Network (DX PacketCluster) is all about, and how you may take part in the latest method of DX spotting to help increase your DXCC and, maybe, improve your scores in a DX contest.

This system can be an immediate emergency network.

Not only is this network local to our Northern area, but it's in other parts of the U.S. and in Southern California. Eventually, during non-contest times, you may find the entire state linked together, or a node connected via HF to some node out of state. The DX PacketCluster system not only proves its greatness to the DXer, but in the times of a disaster, this system can be readily available to assist OES and other state agencies with an immediate emergency network. For an idea as to how this can be accomplished may be covered in another article, or you may obtain a copy of the W6GO/K6HHD QSL Manager List #108 and check the column on the DX Packet Spotting Network for a glimpse as to how this network could function during an emergency.

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TCP/IP from page 14

A variation on BootP allows the client to send a file name in the first request. Also, sometimes a BootP client already knows its IP address and/or the address of the server. If the client already knows the address of a server, then it uses that address instead of broadcasting the request.

Usually, the broadcast address for IP is all 1s, (in dotted decimal notation 255.255.255.255). In the presence of subnetting, however, it is possible to broadcast just to your subnet, that is, to broadcast to all hosts on a physical network that has been assigned one subnet address. One of the features of BootP is that it returns the broadcast address you should use to broadcast to your subnet.

BootP is more general-purpose than RARP. RARP is a hardware link-level protocol, used mainly on Ethernet networks. BootP, on the other hand, is IP/UDP based. Unlike RARP, BootP does not require special drivers to process raw link level protocol packets. This protocol is not supported by the KA9Q Internet Package.

Proxy ARP

Proxy ARP is another method similar to subnetting that allows a single internet address to be used by multiple physical networks. Proxy ARP is a technique that is used only by networks that use ARP to map internet addresses to physical addresses. Proxy ARP is also called promiscuous ARP and the ARP hack.

Proxy ARP is used by gateways to trick the rest of the network into thinking that no networks are attached to it, when actually multiple networks can be connected to the gateway. The gateway returns its own physical address when ARP requests come in for the networks attached to it, and routes packets onto the "hidden" networks when necessary.

The major advantage of Proxy ARP is that it can be added to a single gateway on a network without disturbing the routing tables in other hosts or other gateways on the internet. Proxy ARP completely hides the details of actual physical connections. The disadvantage of Proxy ARP is that it only works with networks that use ARP for address resolution. This protocol is not supported by the KA9Q Internet Package.

TCP/IP Products

Over 130 vendors offer TCP/IP products today. Although the most common implementations of TCP/IP are for workstations and minicomputers, products are beginning to proliferate for microcomputers and mainframes as well.

All [a Ham] needs to run the KA9Q Internet Package [is] a PC [and] a TNC which supports KISS mode.

Since their inception, the TCP/IP protocols have been implemented on a wide variety of equipment including board-level products, gateways, network testers, front-end processors, microcomputers, minicomputers, and mainframes.

All an amateur radio operator needs to run the KA9Q Internet Package besides a PC supported by the package is a TNC which supports KISS mode. Most commercial TNCs available on the market today support KISS mode.

TCP/IP Summary

TCP/IP is a feature-rich set of protocols for interoperability among diverse computers on internetworks. A very large installed base uses TCP/IP, necessitating continued support for the protocols. Areas of development are new applications, performance, maintenance, network management, and integration with other networking standards. Future trends are towards integrating TCP/IP with OSI, with a final goal of full migration to OSI. For its use in Amateur Radio, the challenge will be to integrate TCP/IP with the existing packet radio services. For the next few years, however, TCP/IP will enjoy continued acceptance in the amateur radio packet community as the most solid approach to internetwork connection.

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Invitation to DXPSN from page 15

Chuck's article lists the frequencies and locations of the DXPSN nodes. Who knows, the "DX bug" might just bite you. After all, there is HF Packet DX too!

There were 245 different countries reported on DXPSN just during the period June 14, 1988 through September 14, 1988! This included 6325 announcements of 3049 different DX stations. We hope to have a complete set of current statistics for the next issue which will show you how many countries you would have worked by now on each HF band had you just followed the announcements!

There were 245 different countries reported on DXPSN just during the period June 14 through September 14, 1988!

We DXPSN SYSOPs are heavily involved in packet, but few of us have a feel for the "real" world of packet. We hope to learn about that from the rest of the pages in this newsletter, and we hope that the "real" packeteers will take the time to learn about our activity by reviewing the DXPSN pages.

Connect, do a "SHOW/DX" and be ready to dust off your HF gear!

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NCPA General Meeting Minutes

April 2, 1989

SYSOP Session

The meeting started at 10:00. The first part of the day was reserved for BBS SYSOP issues. The following items were covered:

For sale:

See WA6AOD bulletin on FCC policy. SOCAL does not allow prices in 4SALE bulletins.

[See "The Facts About 'For Sale' Items" in this issue. — ed.]

K1UGM cited for 4SALE, rescinded. K4TKU ditto.

N6VV: Don't send to ALLUS unless you're willing to ship. Proposed that current policy remain in force.

Notify users that ALLCA 4SALE bulletins should not have a price.

Designators:

Use TO field to specify area of interest. Eg: 4SALE, AMSAT, etc. Standard list? (KI6HH, K6IYK?)

W0RLI: need to carry distribution list with the info. Eg: @AMSAT. Info gets lost between gateways when turned into ALLCAN, etc.

Dayton should adopt a single continental designator. Current standard designators are ARRL, AMSAT, USA.

Proposed NCPA support for USA unless Dayton comes up with something else.

N6VV will distribute designators that should not be modified.

Hierarchical addressing

Example:

AA4RE.#NOCAL.CA.USA.NA

Octothorp (#) is used to specify a local designator.

Possible mod: interpret # fields only if following field matches some specifier (eg: CA).

BBS LAN Forwarding:

SACVAL: 223.60 (NWE RDH XX XZ LW)

NBAY: 223.52 (PW CMU EEG IIU JLT QMY GOZ WW6L)

EBAY: 223.54 (VV FGC U FY CPO N7FZY (pending))

OTHER: 223.58 (ASR RE OA RAU BX YHJ ZVW)

MRY: 441.5 (RLI IRS IYA EH HH DUI MPW NSG LDL MC OWT)

bulletin gateways: RDH, PW, VV, RE, RLI.

No consensus on using gateways for general mail. Left up to individual SYSOPs.

Paths to SOCAL:

Paths via N6EEG, WB9LOZ, N6OA, W0RLI.

WB6ASR reports trip to AMT-11 site to repair it.

W0RLI: Can forward entire bulletin load in 45 minutes during evenings.

(Question: Is forwarding quickly at 24 hour intervals preferable to forwarding slowly but continuously?)

WA6BQP requested alternate paths, does not get sufficient bulletins from SOCAL.

Lunch

After all of the BBS SYSOP business was conducted, there was a break for lunch.

General Session

After lunch at 12:00 the second part of the meeting was started. This session was for the general packet community.

Outside Agencies:

N6VV: Need NCPA to coordinate packet with outside agencies and to coordinate between factions within packet.

NCPA Board Election:

Nominations for NCPA Board:

K7WWA, WA6JCW, W6GO, K3MC, N6VV, AA4RE, WD6CMU, KI6HH, AA6ER, WA8DZP

The following seven board members were elected by secret ballot:

W6GO, K3MC, N6VV, AA4RE, WD6CMU, AA6ER, WA8DZP

433 Band Plan:

Proposed [channels for]:
433.0-433.33x100kHz
433.31-433.4910x20kHz
BBS backbone (replace 220.90)
TCP/IP backbone
DX
N6VV downlink
TCP/IP
kb.
Further allocations as needs arise.

2m allocation:

Ben Carlucci, NARCC spectrum management committee person.

Possible recommended uses for 145.7-147.8:
Channels for TCP/IP(75 votes)
2xLAN (79 votes)
kb(71 votes),
Experimental(73 votes)

Unanimous vote for support of TCP/IP on .75.

220:

221.04 DX backbone.

Motion passed to draft a letter to ARRL supporting their effort to retain 200-222 MHz.

Motion passed to draft a letter to NARCC stating that we are coordinating 220.85-.95, 221.04, 223.52-.62.

Communications Committee:

KI6HH proposed publicist to coordinate communications within and without northern California area.

Motion changed to communications committee.

Proposal for dues of $10 to cover cost of publication.

See AA4RE for list of communications committee volunteers. [ed. note: see our masthead.]

NCPA Official Address:

N6VV has rented a PO box:

6680B Alhambra Ave.
Suite 111
Martinez, CA 94553.

Meeting broke up as people rushed forward with their money.

Impromptu Board Meeting:

President: N6VV

Secretary: WA8DZP

Treasurer: WD6CMU

N6VV will copy constitution and send, along with directions, to board members before next BofD meeting at N6VV's house, April 16th at 10:00.

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NCPA Board Meeting Minutes

April 16, 1989

The Board of Directors meeting of the Northern California Packet Association (NCPA) convened at 1000 PST on April 4, 1989. Present at the meeting were the following individuals:

N6VV, AA4RE, KA6ETB, WA8DZP, W6GO, KI6HH, AA6ER, K3MC, WD6CMU, WA6AEO, WA7NZL, WW6L, WA6JCW, WD9BIV

All board members were in attendance. The board members are:

N6VV, K3MC, WD6CMU, WA8DZP, W6GO, AA6ER, AA4RE

Meeting Agenda

Lew, N6VV, NCPA President, proposed the following agenda for the meeting:

1. Who are we?
2. Relationship with NARCC
3. Education
4. Additional Committees
5. Position on ARRL Code/No Code Committee Report
6. Support of ARRL's 220 MHz position

NCPA Charter

He also proposed the following charter for the organization:

1. Coordinate Packet VHF/UHF band plan in NORCAL
2. Act as Packet NTS Coordinator
3. Act as Packet mailbox Coordinator
4. Act as AX.25 Network Coordinator
5. Education for the general amateur packet community

Board Actions

1. A motion was passed to limit the scope of NCPA for the present time to the charter proposed by N6VV and detailed above. There was some discussion about including other organizations such as the DX PacketCluster into NCPA. The board decided that this was not feasible at the present time.

2. N6VV discussed his presentation to NARCC concerning NCPA at their recent meeting. NARCC passed two motions concerning NCPA. The first was to recognize NCPA as the sole packet coordinating body in NORCAL.

The second was to work together to develop a band plan for NORCAL which is acceptable to both organizations.

3. Brad WA6AEO was elected NCPA Frequency Coordinator by the board. The board empowered Brad to contact NARCC and to present our band plan to them and establish a relationship for frequency coordination planning.

4. The board formed the following committees within NCPA and appointed chairpersons for those committees:
PBBS — Roy AA4RE
TCP/IP — Dewayne WA8DZP
Education — Glenn AA6ER
Publications — Tony KI6HH
Technical — Mike K3MC
DX PacketCluster — Jay W6GO

5. A motion was passed to have NCPA contact the ARRL and to let them know that it does not support the recommendations of the Code/No Code Committee as regards to its 2 meter frequency recommendation. W6GO was delegated to write the letter to the ARRL.

[See "ARRL No-Code Plan Needs Work", p. 3. — ed.]

6. A motion was passed to notify the ARRL of NCPA approval of their 220 MHz filing with the FCC. N6VV will contact the ARRL Division Director to inform them of our position.

7. A motion was passed to have NCPA participate in the ARRL Pacific Division convention this year (PacificCon). NCPA will organize several sessions on packet radio at the convention and will also have a booth. WA8DZP was delegated by the board to contact the PacificCon management and represent NCPA in this matter.

8. A motion was passed to have a bulletin distributed through the packet network describing the mission and objectives of NCPA. AA4RE will distribute a special version for PBBS SYSOPs and WA8DZP will prepare one for the general amateur packet community.

9. A motion to have NCPA adopt a position on the NET/ROM vs TheNet controversy was defeated.

10. The board deferred setting the date of the next general NCPA to the following board meeting.

11. The board deferred action on a new set of articles and by-laws for NCPA to the next board meeting.

Action Items

1. The NCPA Newsletter will have its first issue on June 1st.

2. NCPA will have its first education item on packet available by July 1st.

3. Any letters written on NCPA stationery are to be copied to the NCPA secretary WA8DZP.

4. WA6AEO will produce a network map for inclusion in the newsletter and general distribution.

5. The next board meeting will be on June 4th at 1000 PST. It is open to all who wish to attend.

/EX

NCPA Board Meeting Minutes

June 4, 1989

The Board of Directors meeting of the Northern California Packet Association (NCPA) convened at 1000 PST on June 4, 1989. Present at the meeting were the following individuals:

WA8DZP WD6CMU AA4RE WB6ZVW WD9BIV WB9LOZ K9AT W6GO K3MC N6VV KI6HH WA6AEO

All board members except AA6ER were in attendance. The board members are:

N6VV WD6CMU WA8DZP W6GO K3MC AA6ER AA4RE

Proposed Agenda

Lew, N6VV, NCPA President, proposed the following agenda for the meeting:

1. No-Code letter status 2. Dayton Hamvention Report 3. Accomplishments since last meeting 4. Newsletter 5. Response to ATV interference on 432 MHz 6. 900 MHz Band Plan 7. Current Packet Network Futures 8. PacificCon participation 9. NARCC liaison activities

Board Actions

1. The board moved to send a letter to the ARRL No-Code Committee expressing NCPA position concerning their recent report. A letter the text of which had been written by Jay W6GO was adopted. [See "ARRL No-Code Plan Needs Work", p. 3. — ed.]

2. There was much discussion on the happenings at the Dayton Hamvention this year. In particular, discussions centered around the new 9600 bps radio modem from TAPR. The board discussed the possibilities of getting most of the amateur packet community up to that speed from the current 1200 bps standard ASAP. The board felt that there was a need for this radio modem technology on bands other then 2 meters as soon as possible. The board moved that NCPA contact TAPR and make them aware of our requirements. This action was delegated to Lew, N6VV.

3. The board moved to assign the frequency of 145.730 MHz as a 9600 bps data channel for TAPR compatible modems. The board directed the NCPA Frequency Coordinator, WA6AEO, to report back to the board with a proposal to implement this action.

4. There was a general discussion on the lack of accomplishments by the organization since the last board meeting. A number of action items from the previous board meeting were not carried out. The board agreed that there will be a written agenda available at least one week before any future meeting. A plan was presented by Lew, N6VV to have NCPA produce a network map which could be distributed via the various ham radio outlets in the area. [planned for next issue — ed.] The proposal was referred to the Education Committee for action.

5. A response to the ATV coordination on 70 cm band issue brought to the attention of NCPA by Bud, KE6DN was discussed. It was noted that ATV activity in NORCAL is not coordinated by either NARCC or NCPA at the present time. It was also noted that the current ATV activity on that band is in the middle of the satellite sub-band. The board delegated to Roy, AA4RE the task of drafting an official NCPA response to this issue.

6. The board discussed the need for a 900 MHz band plan. The board decided that a 4 MHz band was required for packet activities on this band. The board directed Brad, WA6AEO to develop a plan for board approval.

7. The board discussed the need for a general network plan for future packet operations in NORCAL. It was agreed that a group should be formed to work on improving the current network and to develop requirements for future network implementations. No action was taken by the board to actually form such a group at this time.

8. The board reaffirmed its decision to participate in PacificCon this October. Lew, N6VV agreed to put on an "Introduction to Packet Radio" presentation. The board also agreed to organize a "Future of Packet Radio" panel session also. The members of the panel are to be determined in the future. Dewayne, WA8DZP was designated to be the NCPA liaison to PacificCon.

9. The board discussed liaison activities with NARCC. The board directed Brad, WA6AEO to contact the new NARCC 220 Coordinator, Bob Baker KB6JPZ and work on a 220 MHz band plan.

10. The board discussed possible names for the NCPA newsletter. The name "NCPA Downlink" was chosen after much discussion. The deadline for submissions to the first issue of the newsletter was set for June 18th. The first issue is to go to press by July 1st.

11. The date for the next board meeting was set for 1000 PDT on August 27, 1989.

12. The board deferred setting the date of the next general NCPA to the following board meeting.

13. The board deferred action on a new set of articles and by-laws for NCPA to the next board meeting. Bill K9AT is to develop/rework a new constitution for presentation to the board.

Action Items

1. All articles for the NCPA newsletter should be in by the deadline of June 18th.

2. The first issue of the NCPA newsletter is to be published on or about July 1st.

3. AA4RE is to write a letter expressing NCPA's position on the ATV issue by June 18th.

4. A proposed 900 MHz Band Plan is to be completed by June 18th.

5. The NCPA plans for PacificCon are to be sent to the PacificCon program chairman by June 30th.

6. N6VV will communicate to TAPR our concerns about TAPR developing high-speed packet radios for frequencies higher than 2 meters by June 18th.

/EX

Committee Chairmen

Brad Watson, WA6AEO	Frequency Coordinator	@ WA6AEO
Roy Engehausen, AA4RE	Packet BBS	@ AA4RE
Dewayne Hendricks, WA8DZP	TCP/IP	@ KB6OWT
Glenn Tenney, AA6ER	Education	@ K3MC
Anthony Straight, KI6HH	Publications	@ KI6HH
Mike Chepponis, K3MC	Technical	@ K3MC
Jay O'Brien, W6GO	DX PacketCluster	@ N6VV
Bob Sanders, WA6JCW	Keyboard	@ KD6XZ
Steve Harding, KA6ETB	Traffic & NTS	@ KA6ETB

/EX

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Please "✓" all that interest you: **Keyboard-to-keyboard** .....

BBS SysOp ..... **BBS user** .....

NET/ROM .....**TCP/IP** .....

DX PacketCluster .....**Anything else?** .....

Please enclose a check or money order for $10.00 for one years' dues, payable to NCPA. Mail to NCPA at the return address shown below...

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